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ABSTRACT

This study compared achievement of students in two types of deliberate learning communities at William Rainey Harper College (Illinois) with achievement of students in two comparative groups. In the "linked classes" format, the same students enrolled in the same two course sections and two faculty members taught in a team format. In the "coordinated studies" format, one group of students all registered for the same five course sections. There were 125 students in the linked classes model and 256 students in three clusters of coordinated studies programs. Transcript analysis was used to examine traditional academic achievement and a survey instrument was used to determine the extent to which such objectives as group skills and improved learning attitudes were achieved. Results of both formats on students' later achievement in advanced courses were unclear since few of these students took advanced courses and many were no longer enrolled at the follow-up time. However, two measures (grade point average at Harper and percent saying they felt their technical skill preparation for a job was good) favored the comparison groups over the experimental groups. Significant differences in group skills and in attitude toward learning favored the experimental groups over the comparison groups. The report suggests the need for evaluation of the comparative costs and benefits of wholistic learning communities. (Contains 13 references.) (CK)

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LEARNING COMMUNITIES' IMPACT ON NATIONAL AGENDA GOALS FOR HIGHER EDUCATION

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This paper was presented at the Thirty-Sixth Annual Forum of the Association for Institutional Research held in Albuquerque, New Mexico, May 5-8, 1996. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Jean Endo
Editor
AIR Forum Publications

ABSTRACT

As the emphasis for learning outcomes has come to the forefront in educational concerns, new wholistic learning environments are being created all over the nation. They all have certain attributes in common such as the faculty member is not the sole authority, student empowerment in the learning process, high concentration of group work, cross discipline approach and a high energy and dedication level to the project by all. As institutional researchers become drawn in to help design the evaluation of these learning environments, particular challenges face them. The typical research involving significance tests between experimental and comparison groups must be replaced by more complex cost benefit type of analyses involving a wider variety of experts. A large number of criteria and measurements need to be developed to evaluate these complex learning environments. It is also important to conduct these evaluations over a longer time period to determine if any changes are permanent.

Harper College had developed two types of learning communities and compared students in them to students who took the same courses in the same time period but outside the learning communities two or three years after the event. While some of the results of the comparison are very promising, this is just the beginning and these findings need to be verified many more times. In addition, a wider variety of criteria measures need to be developed over a variety of learning environments. A good cost model needs to be developed to compare these new learning environments to standard classroom situations. Institutional Research is being thrust into this new world of evaluating learning outcomes and is being challenged to develop new tools and strategies to respond to these new opportunities.

WHAT IS A LEARNING COMMUNITY?

Webster's Dictionary provides us with the most widely used and accepted definition of community:

> A unified body of individuals; the people with common interests living in a particular area; an interacting population of various kinds of individuals in a common location; a group of people with a common characteristic or interest living together within a larger society; a group linked by a common policy; a body of persons or nations having a history or social, economic and political interests in common; joint ownership or participation; a social state or condition.

Within this definition we have underlined some critical words which are important when we speak about learning communities. Integrated Learning is another key factor in defining Learning Communities.

> Webster's Dictionary defines "Integrate" as:
> To form into a whole, to unite with something else; to incorporate into a larger unit; to end the segregation of and bring into common and equal membership in society or an organization.

Combining the underline words within the definitions of both "community" and "integrated", will provide a verbal picture of what is a Learning Community.

Gabelnick[2] and MacGregor state, "In learning communities, students and faculty members experience courses or disciplines as complimentary and connected...and by restructuring curricular materials entirely, students have opportunities for deeper understanding and integration of the material they are learning, and more interaction with one another and their teachers as fellow participants in the learning enterprise.... Learning communities restructure the curriculum, address issues of the teaching and learning process, and foster collaboration and community.... They (colleges seeking educational reform) see learning communities as a wholistic comprehensive approach to educational change that delivers an ambitious array of traditional general education skills and values while also creating a sense of engagement, community and intellectual coherence."

They further state[2], "...learning communities enhance other general education reform initiatives because their structure encourages connection, engagement and curricular coherence. These structures can bring us (faculty) together at a time when many of our institution's practices and boundaries keep us apart."[1]

Lawyer and teacher, Alan Dershowitz describes critical thinking as he writes about teaching his

inter-disciplinary courses at Harvard called, Thinking about Thinking: "By juxtaposing our different disciplines, we're forcing students out of their mind-set and making them think about things from a wholly different perspective."[3]

DIFFERENT MODELS OF LEARNING COMMUNITIES

One can develop learning communities in many different configurations. We will highlight several structures that have been utilized at universities and community colleges throughout the United States. No matter what configuration we are discussing, we should keep in mind that the overall goals are consistent and across the board: (1) reorganization of curriculum to enhance greater social coherence and involvement by students and faculty; (2) enrich students' intellectual engagement in the subjects; (3) curriculum reorganization which demonstrates the interwoven nature of the individual subjects as well as the interconnectedness of the world at large.

Although each institution varies the institutional settings and structure, we will identify four basic types of learning communities. They are (1) Linked courses; (2) Freshman Interest Groups; (3) Federated Learning Communities; and (4) Coordinated Studies.

The Washington Center for the Advancement of Undergraduate Education has been instrumental in developing learning communities throughout the State of Washington. They have produced a Directory of Learning Communities which details the universities and community colleges across the nation and the various types of learning communities offered at each institution.[4]

LINKED COURSES

The easiest type of learning community is to simply pair two courses and co-list them in the class schedule. Students then co-register for both courses. At Wm. Rainey Harper College we differentiate a difference between what we call "Loosely Linked courses" and "Linked Courses".

Loosely Linked

In the "loosely linked" format each instructor individually teaches his/her courses but the two instructors coordinate their syllabi and assignments. The two courses can sequentially build on each others course content or a central theme may be determined which both instructors

teach toward. Examples may include: math courses which support science courses; speech courses which utilize the themes of environmental ethics in a philosophy course; remedial math and remedial reading which address issues specific to a special population of students; art and music taught to a common theme of "popular culture."

The University of Washington has a writing across the curriculum program which loosely links various types of writing with twenty-seven general education lecture courses. Linked courses range from matches in the social sciences and humanities to links with the natural sciences. The program is successful even if the students in the writing course make up a small portion of those enrolled in the larger lecture courses. The students in the writing classes become a small community with a shared sense of identity.[1] The State of Washington also recognizes as desirable the special "W" (writing-intensive designation) on the students transcript.

Harper College loosely linked an interior design studio course with a supporting architectural drafting course. The instructors coordinated syllabi and assignments geared toward completing a loft renovation project. While design students studied and produced drawings based on the aesthetic aspects of wall designs and custom fireplace and stair designs, concurrently they would complete technical drawings of the same subjects in the architecture class. The students ended up with a more complete project for their portfolios.

Linked Courses

In Linked Courses two classes usually carrying equal numbers of credits are combined with both students and teachers together in the same classroom. There is usually a theme produced which both instructors teach toward. The students benefit from having the expertise of two disciplines and two perspectives available to them at all times. This format requires much more extensive preparation by the faculty. It can prove difficult for some colleges to provide a room large enough for 40 students who are required to conduct much of the class time meeting in small groups instead of the traditional lecture format. The extended two hour format gives the instructors much more flexibility in the types of activities that they can require of the students

(field trips, classroom research, videos and discussions, community service).

Two instructors at Harper College taught a course entitled "Of Body and Mind". Instructors of Philosophy and Psychology combined their classes by meeting twice a week in 2-hour blocks with all 40 students. Topics such as "Are human beings free?", "Do we have souls?", "What is the self?" and "Are we biologically determined?" were covered in the course.

Linked and loosely linked courses are prevalent at universities and community colleges throughout the United States and Canada.

FRESHMAN INTEREST GROUPS (FIG)

This type of structure links three courses around common pre-major themes and has a peer advising component. Typically this is utilized by larger 4-year colleges. Students register for all three courses and travel as a subset of about 25 students to larger classes. This helps students develop a support system which is often critical to first-year college students.[1]

During the summer, the University of Oregon, invites all incoming freshmen to join one of the 20 or so FIGs which have themes such as Journalism and Communication, Art and Architecture or Pre-Health Sciences. The faculty are not expected to coordinate their syllabi, but many do so anyway. Each FIG has a peer leader (student) who convenes the group weekly during the semester to explore relevant issues for the students in his/her group, thus forming a specific community.[1]

The University of Washington has a similar FIG; however, the peer leaders are upper-division students usually majoring in the focus area of the FIG. Their structure for peer advisors appears to be a little more extensive. They hold weekly meetings for all of the peer leaders with a faculty or administrative coordinator.[1]

Other universities using Freshman Interest Groups include University of Hawaii at Manoa, Hawaii; Illinois State University in Normal, IL; Michigan State University in East Lansing, MI; North Carolina Appalachian State University in Boone, NC; Gettysburg College in Gettysburg, PA; Temple University in Philadelphia, PA; Eastern Washington University, Cheney, WA; Seattle Pacific University in Seattle, WA;Washington State University in Pullman, WA; University of Wisconsin in Madison, WI;

University of Guelph in Guelph, Ontario, Canada.[4]

FEDERATED LEARNING COMMUNITIES (FLC)

The Federated Learning Community (FLC) represents a program with the intent of overcoming faculty and student feelings of isolation and anonymity that can prevail at large research institutions. Students co-register for three courses, developing a community as they attend the same classes. In addition, they must register for a 3-credit program seminar or discussion group. The discussion group is led by a "Master Learner". The Master Learner is a faculty person from a discipline other than those of the federated courses. He/she is expected to become a learner with the students and as a co-learner brings new energies and perspectives on the inter-relatedness of the three courses. The Master Learners provide skills developed as instructors which are invaluable in facilitating the group.[1] You can see how this type of education can become regenerative for faculty members and provide opportunities for new types of student-faculty interaction. Faculty of the three co-listed classes are not asked to coordinate their course offerings so the "cost" to the institution is in providing release time for Master Learners only.

The following institutions have successful federated learning communities: Diablo Valley College in Pleasant Hill, CA; SUNY at Stoney Brook, NY; Centralia College in Centralia, WA; Skagit-Whidbey College in Oak Harbor, WA; Spokane Community College in Spokane, WA; Western Washington University in Bellingham, WA.[4]

COORDINATED STUDIES

This type of learning community requires the most radical restructuring of course offerings and requires both faculty and students to become fully engaged in the interdisciplinary offering which revolves around a theme. Coordinated studies offerings are team taught by three to five faculty members who are physically present during all class times. Often this course of study becomes the students full-time academic load for one semester. The faculty involved determine the scheduling and thematic concerns for the entire coordinated studies offering. Scheduling often includes seminar or small group discussion periods, lecture which may include audio-visual offerings, field trip periods and, in some

instances community service periods which link students to community based projects. Team teaching provides multiple perspectives on the subject matter and encourage interrelated insight by the students. Often instructors will hold faculty seminar discussions which give faculty opportunity to explore the inter relatedness of their subjects. These may or may not be attended by students. Variable and significant blocks of time encourage active learning and opportunities for students to assume responsibility for integrating the learning into their lives and their communities. It is quite common for students to become politically or socially active in current relevant issues both on their campus and in their surrounding communities.

As you can see by the thematic titles below, this format allows for great creativity in combining courses. The courses which were combined are listed below the course title.

"Science Shakes the Foundations: Dickens, Darwin, Marx and You"
English Composition/Physical Anthropology/Economics/History of Science
"Reflections of Nature"
Visual Arts/Physics/Biology/Literature/Computer Science
"Global Village"
Linguistics/English/Psychology/Environmental Biology/Philosophy
"Life Quest"
Business/Philosophy/Political Science/Psychology/English

Coordinated studies exist within larger, traditional institutional settings as well as many commun ity colleges. The following states have extensive coordinated study programs in the university and community college systems. Arizona, California, Colorado, Illinois, Maine, Michigan, Missouri, New York, North Carolina, North Dakota, Oregon, Pennsylvania, South Dakota, Texas, Tennessee, Virginia, Washington, Wisconsin. For a more detailed listing, please consult the Directory of Learning Communities.[4]

THE BENEFITS OF LEARNING COMMUNITIES

1- Students understand how subjects and issues are all interrelated and cross subject matter boundaries.

2- Learning communities provide an academic community for students who attend commuter schools. This sense of community helps bolster commitment and helps to stem the tide of student attrition.

3- Students become active and responsible participants in their own education. Social and academic commitment are increased which results in higher retention. Students stretch their assumptions about coursework and the nature of going to school. Higher level and critical thinking are encouraged.

4- Students have a greater intellectual interaction and connection with each other, faculty and members of the outside community. The exposure to diverse populations is very great.

5- Learning communities provide faculty revitalization and encourages the sharing of knowledge between faculty.

6- Learning communities provide an excellent forum to explore and understand diverse perspectives.

7- Learning communities are a pedagogical style and organizational framework that is student centered rather than teacher centered and emphasizes active student association and involvement.[5]

8- Bringing several faculty members together to teach adds an intellectual richness to students experience that traditional pedagogy does not.[6]

RESISTANCE TO CHANGE

In order to promote the development of learning communities at any institution of higher education there exists resistance to change by faculty, students and administrators.

Faculty Concerns

Faculty are required to change their mental models, those deeply held cognitive value-based frameworks which people use to interpret situations.[7] In order to participate in a learning community, instructors must set aside their traditional methods of teaching and to identify new definitions of teaching and learning. The teacher is removed as the authority who provides knowledge and is replaced by the facilitator who is an active participant in learning with and from the students. The best teachers are also learners, they learn from their colleagues and their students. Certain faculty are more receptive to shifting their paradigms than others and these faculty must be encouraged to participate.

Parker Palmer speaks about traditional education by saying, "I am not against lecturing, listening and memorization...But in my educational experience, too much of the lecturing was authoritarian, too much of the listening was unengaged, too much of the memorization was mechanical and the ethos of too many classrooms was destructive of community."[8]

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As instructors begin to change their mental models, there are typical reactions to the disequilibrium that they feel. These include (1) incorrectly communicated information and rumors; (2) polarization of faculty; (3) undermining loyalties; and (4) increased ambiguity about the project.[9] Each of these can be specifically addressed by a facilitator who is an excellent listener and skillful people manager. Hord and Rutherford detail specific steps to address the various types of change.[10]

Another major concern of teachers is a logistical and operational one. Cartwright writes, "Change is best understood in operational terms. Teachers and others, will naturally relate to change or improvement in terms of what it will mean to them or how it will affect their current classroom practice. What changes in their own or their students' values, beliefs, and behavior will it require? How much preparation time will it demand? By addressing these and other questions in concrete, practical terms, a facilitator can communicate more relevantly and rescue resistance to improvement efforts."[10]

Learning communities stress higher order of thinking skills as they teach to a particular theme. Although learning communities are strongly outcome driven, many faculty members fail to recognize this. There is the perception by some faculty that course content suffers or that the individual courses involved in learning communities do not meet the same transfer criterion as standard courses. Research exists which refute these claims, [11] however, there are still gray areas with regard to student preparedness for subsequent level courses. Learning communities often present the content in a manner that is difficult to measure using traditional research tools or parameters.

Certain faculty are of the mental model that the teacher is the authority in any subject and that it is the teacher who must evaluate students academic progress. Learning communities stresses a partnership between teacher and student. Grading often involves self-evaluation. Often Coordinated Studies programs will give a single grade in all integrated subjects. Furthermore, the instructor grading approximately 20-25 students, has "expertise" in only one of the integrated subjects. Needless to say, faculty objection has been noted on several levels related to grading. The grading structure continues to be at the discretion of the faculty involved and many creative solutions are being used.

The public seems to be demanding accountability for both student and faculty productivity.

Marcia Mentkowski, Director of Research and Evaluation and Professor of Psychology at Alverno College feels that learning communities "offer faculty an investment and role in educational restructuring. Faculty are energized by and take responsibility for whether learning works for students...there is a shift in the faculty role here from expert in the discipline and transmitter of culture to a role that includes creating the context for learning and restructuring the institution."[11]

Ted Marchese, Vice President of the American Association of Higher Education, addresses the doubt that "these programs (learning communities) will never be sustainable because they ask too much of already overburdened faculty members. If it could be shown that this approach, ever more smartly done, resulted in a whole different level of learning attainment, the grounds would be there for a whole different way of assigning faculty loads."[12]

Student Concerns

Students are forced to change much in the same way faculty do. Students are taking much larger risks as they take linked or coordinated studies programs which represent more than the normal class credit hours. Risk of failing more than one class is real.

Administrative Concerns

Administrative concerns include:

1- Room scheduling and providing adequate space for large groups which are not in a lecture format.
2- Minimum and maximum enrollment numbers required in these courses. The student/faculty ratio may need to be stretched in order to encourage these new programs. This may or may not have budgetary concerns.
3- Funds to support administrative costs and faculty stipends to promote the program.
4- Faculty who wish to participate in learning communities must obtain the signature of their department coordinators and divisional deans in order to be absent from their departments or to alter their class load for a semester. Coordinators and Deans both have the opportunity to misuse their power in this situation, intentionally or unintentionally. Ascertaining the reasons for this misuse of power is critical. Since faculty are involved in an inter-department activity, the accountability of a learning communities faculty team may be questioned by Deans.
5- Divisions within the college will front the cost of part-time replacement faculty while full-time faculty are involved in learning communities.
6- Distrust and animosity between faculty and administration will need to be addressed to alleviate development issues during periods of change. The most successful learning communities are faculty driven.

Vice President Ronald Hamberg, who led the effort to establish learning communities at Seattle Central Community College, sees learning communities as a vehicle for community colleges to become

leaders instead of followers in general education. He states, "With half of the students entering college through two-year institutions," he argues, "it's time for us to assume more leadership in shaping a vision of general education and get out of the role of step-children to the four-year institutions."[13]

SPECIFIC CHALLENGES TO INSTITUTIONAL RESEARCH

Evaluating learning communities offers unique challenges for institutional researchers. First of all, learning communities offer a complex set of objectives making it difficult to identify all the criteria needed to determine their effectiveness. Even when the criteria are identified it is difficult to develop good measures to use in the evaluation process.

Second, even more challenging is that significant differences between the experimental group and a comparison group or a standard are no longer very relevant. What is relevant is the magnitude of the differences. Are the differences enough to justify deficiencies produced in other learning areas or in increase costs? It may require panels of different kinds of faculty and staff to make these kinds of judgments.

DESIGN OF STUDY

There are two types of learning communities offered by Harper College. The first one is called linked classes which involves the same students enrolling in the same two course sections and the two faculty teaching in a team format. These linked classes were offered in the fall of 1993, the spring of 1994 and the fall of 1994. Comparison groups were formed by identifying students who had taken the same classes in the same semesters but in a non-linked mode. Since there was no selection criteria for taking the linked classes, no ability differences were expected between the experimental and comparison groups but that will be checked out. There were 125 different students who enrolled in these linked classes and 190 students met the comparison group standards.

The second type of learning community at Harper College was called coordinated studies which has one group of students all registering in the same five course sections. This is a full-time load and bring students together as a community far more intensely than linked classes. There were three clusters of coordinated studies, fall 1992, spring 1993, and fall 1993. Since these were offered earlier and

were full time, students participating in the coordinated studies programs were much more likely to have left Harper College earlier than students in linked classes. Comparison groups were formed by selecting students who had taken the same courses - but not in the coordinated studies mode - at the same time. Again, since there were no selection criteria for admission to coordinate studies, no ability differences were expected between the experimental and comparison groups. However, this will be checked out. There were 256 in the experimental group who had registered in one of the coordinated studies programs and 281 in the comparison groups.

The objectives of these learning communities were to encourage intensive group interaction and communication and promote independent learning and thinking skills. The fear was that there might be a loss in course content which would effect students negatively in future traditional learning environments. Measures were developed to evaluate to what extent these objectives were achieved and/or these fears were realized.

The first measure developed was to examine the fear that traditional academic achievement would be negatively effected. This was first done through a transcript analysis of achievement through the summer of 1995. Their overall GPA and GPA in advanced courses - to the ones taken in coordinated studies - were analyzed. Unfortunately community college students do not take many advanced courses so this number was small. This was supplemented later by a transcript analysis of their performance in the fall of 1955 and whether or not they were registered for the spring 1996 semester. It was further supplemented in the telephone follow-up survey by asking students who had transferred what was their new GPA. In both of these cases, the number was small.

The second measure was used to determine the extent to which the objectives of the learning communities were achieved. A survey instrument was developed jointly by the Learning Communities Committee and the Office of Planning and Research. After two mailings, the response rates were 30.5 percent, 38.4 percent, 40.8 percent and 46.8 percent for the four groups - Coordinated Studies Experimental, Linked Classes Experimental, Coordinated Studies Comparison, and Linked Classes Comparison, respectively.

Because of the low response rates, a telephone follow-up was designed. Since the original survey was so long, only nine items were duplicated in the telephone survey. The purpose was to verify the extent to which the original conclusions held up with a higher response rate. An additional question was added to the telephone survey to determine their GPA at their new college if they had transferred. This was described earlier. The response rates of the combined mail and telephone surveys climbed to 44.9 percent, 64.0 percent, 56.6 percent and 66.3 percent respectively.

As it turned out, the telephone survey did not change the outcome for any one item but simply increased the number. Thus, for the nine items duplicated in the telephone survey, the mail results were combined with them. For this study, low response rates did not seem to bias the results.

RESULTS

Ability Difference

Since there was no selective criteria for admittance to coordinated studies and linked classes it was assumed the ability differences between the experimental and the comparison groups would be very small or non-existent. However, some of the faculty felt that because of the way the programs were marketed, the experimental groups would attract more students who did poorer in traditional learning situations than would be predicted by test scores. In this case they would have higher ACT scores but lower GPA than the comparison group. To check this, the experimental and comparison groups were compared on the following ability measures:

Coordinated Studies

Measure	Experimental Means	Comparison Means	Differences	Level of Significance
- ACT Composite	19.9	18.9	1.0	.05
- High School Rank	51.3	53.7	-2.4	.05
- Base GPA of courses in study	2.74	2.73	.01	N.S.
- Harper GPA through Summer '95	2.55	2.66	- .11	.05

Linked Classes

Measure	Experimental Means	Comparison Means	Differences	Level of Significance
- ACT Composite	18.7	18.0	.7	N.S.
- High School Rank	48.2	51.3	-3.1	N.S.
- Base GPA of courses in study	2.88	2.54	.34	.0002
- Harper GPA through Summer '95	2.28	2.35	- .10	N.S.

In examining the ability measures of those in coordinated studies it appears as expected that experimental students have higher ACT scores and lower GPA measures. The differences are statistically significant but the differences are not large. For linked classes again, the differences are in the expected direction but are not significant.

Impact on Traditional Learning

The fear was that students in the experimental sections of coordinated studies or linked classes would suffer thereafter in their performance level in traditional learning environments. There were nine measures of subsequent traditional learning efforts which are shown in the following tables:

Coordinated Studies

Measure	Experimental Means	Comparison Means	Differences	Level of Significance
- GPA in Advanced Courses (from base courses in study)	2.67	2.82	-.15	N.S.
- GPA at Harper Fall 1995	2.11	2.48	- 3.7	.05
- Transfer GPA	3.40	3.22	.18	N.S.
- Percent who said they had significantly developed basic academic skills	64.9%	70.7%	- 5.8%	N.S.
- Percent who said they were prepared for job with good technical skills	17.2%	39.4%	-22.2%	.05

Linked Classes

Measure	Experimental Means	Comparison Means	Differences	Level of Significance
- GPA in Advanced Courses (from base courses in study)	2.55	2.65	-.10	N.S.
- GPA at Harper Fall 1995	2.44	2.30	.14	N.S.
- Transfer GPA	3.30	3.31	-.01	N.S.
- Percent who said they had significantly developed basic academic skills	70.9%	67.5%	3.4%	N.S.

Unfortunately, there were not many measures of traditional learning available. Only about 10 percent took advanced courses, only 10 percent were still enrolled in the fall of 1995 and only another 10 percent had transferred. Among the five measures for coordinated studies and four measures for linked classes, only two were significantly different in the feared direction. Thus, it is still unclear whether these new wholistic learning environments produce any deficit in traditional learning. This is an area where a

number of additional studies will be needed to determine whether or not these new learning environments affect a loss in traditional learning skills.

Impact on Learning Communities Goal Area

The largest impact by far was achieved in the broad area of group skills. It was also the area in which the most measures were developed. The comparative differences in group area skills were as follows:

Coordinated Studies

Group Area Skill Measures	Experimental Means	Comparison Means	Differences	Level of Significance
- Percent saying they developed groups skills significantly	69.4%	45.2%	24.2%	.0001
- Percent saying they developed interpersonal skills significantly	60.4%	52.6%	8.8%	N.S.
- Frequency of meeting other students outside of class - index	1.58	.94	.64	.0002
- Involvement with groups of students - index	2.88	2.18	.75	.0001
- Percent saying they were more comfortable working in groups	90.05	71.3%	18.7%	.0025
- Percent saying they were better at getting others to work together cooperatively.	82.8%	69.1%	13.7%	.05
- Percent saying they developed long lasting friendships	67.5%	48.6%	18.9%	.05
- Percent who said they were well prepared for job with good interpersonal skills	72.4%	48.5%	23.9%	.05
- Percent who said they were well prepared for job by their ability to work in groups	75.9%	54.5%	20.6%	.05
- Interaction with persons with different sexual orientation - index	1.97	1.45	.52	.001
- Interaction with persons from different countries - index	2.24	1.87	.37	.01
- Interaction with persons of different races - index	2.60	2.28	.32	.01
- Interactions with persons from different socio-economic backgrounds - index	2.59	2.30	.29	.02
- Interaction with persons from different religions - index	2.67	2.42	.25	.025
- Interaction with senior citizens - index	2.15	1.95	.20	N.S.
- Interaction with persons with disabilities - index	1.67	1.60	.07	N.S.

Linked Classes

Group Area Skill Measures	Experimental Means	Comparison Means	Differences	Level of Significance
- Involvement with groups of students - index	2.42	1.70	.72	.001
- Frequency of meeting other students outside class - index	.96	.88	.08	N.S.
- Percent who say they are more comfortable working in groups	90.2%	69.2%	21.0%	.002
- Percent who say they are better getting others to work together cooperatively	80.0%	59.2%	20.8%	.05
- Percent who say they developed long lasting friendships	24.0%	37.9%	-13.9%	.05
- Percent who say they developed inter-personal skills significantly	60.8%	46.0%	14.8%	.05
- Percent who say they developed group skills significantly	62.0%	41.3%	20.7%	.003
- Interaction with persons from different countries - index	2.12	1.76	.36	.05
- Interaction with persons with different socio-economic backgrounds - index	2.48	2.19	.29	.05
- Interaction with persons with different religions	2.54	2.25	.29	.05
- Interaction with senior citizens - index	1.81	1.51	.30	.05
- Interaction with persons with different sexual orientations - index	1.35	1.18	.17	N.S.
- Interaction with persons with disabilities - index	1.40	1.23	.17	N.S.
- Interactions with persons of different races - index	2.29	2.28	.01	N.S.

Thus, within Coordinated Studies, 13 of the 16 measures of group skills showed significant differences between the Experimental and Comparison Groups. Moreover, most of the differences were large and meaningful. It was similar within Linked Classes with 9 of the 13 measures being significant in the anticipated direction.

The second largest change created by these learning environments were in attitude toward learning. The comparative differences in attitudes were as follows:

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Coordinated Studies

Attitudes Toward Learning	Experimental Means	Comparison Means	Differences	Level of Significance
- Percent who want to learn as much as possible	75.5%	58.5%	17.0%	.003
- Index of comfort when instructor states there are no right or wrong answers	1.01	.53	.48	.0001
- Percent who do more reading and research than required	30.7%	19.6%	11.1%	.05
- Percent who say attitude has changed toward handling class assignments	75.3%	63.2%	12.1%	.05
- Percent who say they are better able to ask faculty for help	63.6%	53.3%	10.3%	N.S.
- Percent who say their job is closely related to their major at Harper	10.3%	35.5%	-25.2%	-.02
- Percent who say their job is permanent	16.7%	39.4%	-22.7%	-.05

Linked Classes

Attitudes Toward Learning	Experimental Means	Comparison Means	Differences	Level of Significance
- Percent who want to learn as much as possible	55.1%	45.9%	9.2%	N.S.
- Index of comfort when instructor says there is no right or wrong answers	.56	.39	.17	N.S.
- Percent who do more reading and research than required	24.0%	17.2%	6.8%	N.S.
- Percent who say their attitude toward class assignments was changed	24.1%	71.6%	-26.5%	-.02
- Percent who say they are better able to ask faculty for help	56.0%	49.3%	11.7%	N.S.

Examining coordinated studies of the seven measures of attitudes toward learning, six of the differences were significant in the expected direction. However, with linked classes having only five measures, four of the differences were in the right direction but not significant while the other difference was significant in a non-expected direction. Thus, there appeared to be large attitude changes among those in coordinated studies but for linked classes the direction of attitude change in learning was not clear.

There were a number of other measures that were expected to produce changes in specific directions. These comparative differences were as follows:

Coordinated Studies

Other Measures Expected to Produce Differences	Experimental Means	Comparison Means	Differences	Level of Significance
- Index of success at problem solving	2.16	1.84	.32	.001
- Index of self-esteem improvement	1.17	1.01	.16	.05
- Percent who said they developed oral presentation skills significantly	73.9%	63.1%	10.8%	.05
- Percent who said they were well prepared for their job by their oral presentation skills	65.5%	33.3%	32.2%	.01
- Percent who said they developed critical thinking skills significantly	67.6%	54.1%	13.5%	.05
- Percent who said they were well prepared for their job by good critical thinking skills	58.6%	51.5%	7.1%	N.S.
- Percent who said Harper prepared them well for their job	73.1%	50.0%	23.1%	.05
- Harper prepared them well to transfer - index	1.34	1.21	.13	N.S.

Linked Classes

Other Measures Expected to Produce Measures	Experimental Means	Comparison Means	Differences	Level of Significance
- Index of success at problem solving	1.75	1.81	0.06	N.S.
- Index of self esteem improvement	.73	1.01	-.28	-.05
- Percent who said they developed oral presentation skills significantly	74.7%	54.8%	19.9%	.003
- Percent who said they developed critical thinking skills significantly	57.0%	48.4%	8.6%	N.S.
- Harper prepared them well to transfer-index	1.47	1.13	.34	.002

Among the eight other measures for coordinated studies that were expected to make an impact, all eight of the differences were in the expected direction - some large differences - and six of the differences were significant. These same measures produced less clear meaning among linked classes as two of the five measured differences were significant in the expected direction while one was significant in an unexpected direction.

Finally there were measures that were not expected to be different between the experimental and the comparison groups. These comparative differences are as follows:

Coordinated Studies

Measures Not Expected to be Different	Experimental Means	Comparison Means	Differences	Level of Significance
- Percent who said they developed writing skills significantly	58.6%	62.4%	-3.8%	N.S.
- Percent who said they were prepared well for their job by good writing skills	17.2%	42.4%	-25.2%	-.025
- Percent who said they developed reading skills significantly	49.5%	42.0%	7.5%	N.S.
- Percent who said they were prepared well for their job by good reading skills	24.1%	21.2%	2.9%	N.S.
- Percent who said they developed good research skills significantly	55.0%	54.8%	.2%	N.S.
- Percent who said they were prepared well for their job by good research skills	34.5%	36.4%	1.9%	N.S.

Linked Classes

Measures Not Expected to Produce Measures	Experimental Means	Comparison Means	Differences	Level of Significance
- Percent who said they developed writing skills significantly	63.3%	63.5%	-.2%	N.S.
- Percent who said they developed reading skills significantly	46.8%	45.2%	1.6%	N.S.
- Percent who said they developed research skills significantly	68.4%	59.5%	8.9%	N.S.

Challenges for Future Research

This study has only scratched the surface of what is possible but hopefully will stimulate further research in a number of areas among learning environment evaluations. First, simply a number of additional studies need to be made to verify or contradict some of the conclusions reached in this study. More importantly there is a need to determine whether or not these wholistic learning environments have a negative impact on traditional learning. More measurements are needed to see how students coming out of these environments do in advanced courses of various kinds and in other types of traditional learning environments as compared to a variety of control groups. If deficiencies in traditional learning are verified, are these because of self-selection -- students choosing these learning environments have never done as well in traditional learning as their ability scores would predict -- or because of the lack of emphasis on course content or other curricular structures?

Another concern that needs to be checked is whether or not these new wholistic learning environments are more costly. This question may not be so easy to answer. Many times the differences are subtle. It may be in the short run that class sizes and faculty loads are similar to traditional learning modes. However, as these learning environments move from the experimental mode to everyday conduct, class size and faculty loads may not be able to be maintained. Faculty at Harper College have commented they could only teach one semester in Coordinated Studies and then needed a break. Thus, it may take some time to identify any true cost differences.

Another concern is the wide variety of wholistic learning environments that are emerging. It will be important to identify the relationship between the types of learning environments and the outcomes they produce. This will require a number of different institutions conducting these studies using different variations of learning environments but using similar outcome measures.

One of the greatest weaknesses of the study was the over abundance of group skill measures and the paucity of critical thinking and problem solving measures. What is needed is for a panel of educators who are developing these environments to picture the behavior students would exhibit two years after improving their critical thinking or problem solving skills. These behaviors could then be translated into survey items to be used in the evaluation process. Another task such a panel could take on would be to identify additional possible goals for these learning environments such as leadership skills, facilitating skills, creativity, self-discipline, etc.

While most colleges could conduct such research and evaluation using follow-up surveys, there is a need for independent validation of these outcome measures. These could include specialized tests -- critical thinking tests, etc. -- or several day observations of simulated tasks. This latter method was popular among large companies in the 60s for selecting and/or assessing employees. Such independent validations could only be conducted by well funded research bureaus. Finally, it will be important to develop various panels of judges who can weight the magnitude of goal outcome differences between experimental and comparison groups against the possible loss in cost efficiency or in traditional learning

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